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FAMILY LYCEUM.

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BIOGRAPHY.

HUMBOLDT.

WITH the name of Humboldt we associate all that is interesting in the physical sciences. No traveller who has visited remote regions of the globe, for the purpose of observing the varied phenomena of nature, has added so much to our stock of positive knowledge. While the navigator has explored the coasts of unknown lands, discovered islands and shores, marked the depths of the sea, estimated the force of currents, and noted the more obvious traits in the aspect of the countries at which he has touched; while the zoologist has investigated the multiplied forms of animal life, the botanist the diversified vegetation, the geologist the structure and relations of the rocky masses of which the exterior of the earth is composed; and while each has thus contributed to the illustration of the wonderful constitution of our planet, this distinguished traveller stands alone as uniting in himself a knowledge of all these sciences. Geography, meteorology, magnetism, the distribution of heat, the various departments of natural history, together with the affinities of races and languages, the history of nations, the political constitution of countries, statistics, commerce, and agriculture,—all have received accumulated and valuable additions from the exercise of his rare talents. The narrative of no traveller, therefore, could be more interesting to the man of varied information.

Frederick Henry Alexander Von Humboldt was born at Berlin, on the 14th of September, 1769. He received his education at Gottingen and Frankfort on the Oder. In 1790 he visited Holland and England in company with Messrs. George Forster and Van Geuns, and in the same year published his first work, entitled 'Observations on the Basalts of the Rhine.' In 1791, he went to Freyberg to receive the instructions of the celebrated Werner, the founder of geological science. The results of some of his observations in the mines of that district were published in 1793, under the title of *Specimen Floræ Fribergensis Subterraneæ.*

Having been appointed assessor of the Council of Mines at Berlin in 1792, and afterward director-general of the mines of the principalities of Bareith and Anspach in Franconia, he directed his efforts to the formation of public establishments in these districts; but in 1795 he resigned his office with the view of travelling, and visited part of Italy. His active and comprehensive mind engaged in the study of all the physical sciences; but the discoveries of Galvani seem at this period to have more particularly attracted his attention. The results of his experiments on animal electricity were published in 1796, with notes by Professor Blumenbach. In 1795 he had gone to Vienna, where he remained some time, ardently engaged in the study of a fine collection of exotic plants in that city. He travelled through several cantons of Salzburg and Styria with the celebrated Von Buch, but was prevented by the war which then raged in Italy from extending his journey to that country, whither he was anxious to proceed for the purpose of examining the volcanic districts of Naples and Sicily. Accompanied by his brother William Von Humboldt and Mr. Fischer, he then visited Paris, where he formed an acquaintance with M. Aime Bonpland, a pupil of the School of Medicine and Garden of Plants, who, afterward becoming his associate in travel, has greatly distinguished himself by his numerous discoveries in botany.

Humboldt, from his earliest youth, had cherished an ardent desire to travel into distant regions little known to Europeans; and having at the age of eighteen resolved to visit the New Continent, he prepared himself by examining some of the most interesting parts of Europe, that he might be enabled to compare the geological structure of these two portions of the globe, and acquire a practical acquaintance with the instruments best adapted for aiding him in his observations. Fortunate in possessing ample pecuniary resources, he did not experience the privations which have disconcerted the plans and retarded the progress of many eminent individuals; but, not the less subject to unforeseen vicissitudes, he had to undergo several disappointments that thwarted the schemes which, like all men of ardent mind, he had indulged himself in forming. Meeting with a person passionately fond of the fine arts, and anxious to visit Upper Egypt, he resolved to accompany him to that interesting country; but political events interfered, and forced him to abandon the project. The knowledge of the monuments of the more ancient nations of the Old World, which he acquired at this period, was subsequently of great use to him in his researches in the New Continent. An expedition of discovery to the southern hemisphere, under the direction of Captain Baudin, then preparing in France, and with which MM. Michaux and Bonpland were to be associated as naturalists, held out to him the hope of gratifying his desire of exploring unknown regions. But the war which broke out in Germany and Italy compelled the government to withdraw the funds allotted to this enterprise. Becoming acquainted with a Swedish consul who happened to pass through Paris, with a view of embarking at Marseilles on a mission to Algiers, he resolved to embrace the opportunity thus offered of visiting Africa, in order to examine the lofty chain of mountains in the empire of Morocco, and ultimately to join the body of scientific men attached to the French army in Egypt. Accompanied by his friend Bonpland, he therefore betook himself to Marseilles, where he waited for two months the arrival of the frigate which was to convey the consul to his destination. At length, learning that this vessel had been injured by a storm, he resolved to pass the winter in Spain, in hopes of finding another the following spring.

On his way to Madrid, he determined the geographical position of several important parts, and ascertained the height of the central plain of Castile. In March, 1799, he was presented at the court of Aranjuez, and graciously received by the king, to whom he explained the motives which induced him to undertake a voyage to the New Continent. Being seconded in his application by the representations of an enlightened minister, Don Mariano Luis de Urquijo, he to his great joy obtained leave to visit and explore, without impediment or restriction, all the Spanish territories in America. The impatience of the travellers to take advantage of the permission thus granted did not allow them to bestow much time upon preparations; and about the middle of May they left Madrid, crossed part of Old Castile, Leon, and Galicia, and betook themselves to Corunna, whence they were to sail for the island of Cuba.

It is not the custom of this author to detail personal adventures, his object being to give a scientific character to his narrative; and for this reason his relations may be less interesting to many readers than some of the travels and voyages which have of late been so profusely offered to the public. He is at present engaged in preparing an account of his Asiatic tour, the full details of which will appear under the general title of 'A Journey to the Uralian Range, the Mountains of Kolyvan, the Frontier of Chinese Zungaria, and the Caspian Sea, made by order of the Emperor of Russia in 1829, by A. de Humboldt, G. Ehrenberg, and G. Rose.' It will consist of three distinct works: 1. A geological and physical view of the north-west of Asia, observations of terrestrial magnetism, and results of astronomical geography, by Baron Humboldt. 2. The mineralogical and geological details, the results of chemical analysis, and the narrative of the journey, by M. Rose. 3. The botanical and zoological part, with observations on the distribution of plants and animals, by M. Ehrenberg.

Any formal eulogy on this illustrious author must be altogether unnecessary, for his renown has extended over all parts of the civilized world; and, at the present day, there is not a man of science in Europe whose name is more familiar. Long after his career shall have terminated, Humboldt will be remembered as one of the chief ornaments of an age peculiarly remarkable in the history of the world.

NATURAL PHENOMENA.

EARTHQUAKE AT CUMANA.

FROM the 10th of October to the 3d of November a reddish vapor rose in the evening, and in a few minutes covered the sky. The hygrometer gave no indication of humidity. The diurnal heat was from 82.4° to 89.6°. Sometimes in the midst of the night the mist disappeared for a moment, when clouds of a brilliant whiteness formed in the zenith, and extended towards the horizon. On the 18th of October they were so transparent that they did not conceal stars even of the fourth magnitude, and the spots of the moon were very clearly distinguished.—They were arranged in masses at equal distances, and seemed to be at a prodigious height. From the 28th of October to the 3d of November the fog was thicker than it had yet been. The heat at night was stifling, although the thermometer indicated only 78.8°. The evening breeze was no longer felt; the sky appeared as if on fire, and the ground was everywhere cracked and dusty. On the 4th of November, about two in the afternoon, large clouds of extraordinary blackness enveloped the mountains of the Brigantine and Tataraqual, extending gradually to the zenith. About four, thunder was heard overhead, but at an immense height, and with a dull and often interrupted sound. At the moment of the strongest electric explosion, two shocks of an earthquake, separated by an interval of fifteen seconds, were felt. The people in the streets filled the air with their cries. Bonpland, who was examining plants, was nearly thrown on the floor, and Humboldt, who was lying in his hammock, felt the concussion strongly. Its direction was from north to south. A few minutes before the first there was a violent gust of wind, followed by large drops of rain. The sky remained cloudy, and the blast was succeeded by a dead calm, which continued all night. The setting of the sun presented a scene of great magnificence. The dark atmospheric shroud was rent asunder close to the horizon, and the sun appeared at 12° of altitude on an indigo ground, its disk enormously enlarged and distorted. The clouds were gilded on the edges, and bundles of rays reflecting the most brilliant prismatic colors, extended over the heavens. About nine in the evening there was a third shock, which, although much slighter, was evidently attended with a subterraneau noise. The barometer was a little lower than usual, but the progress of the horary variations was in no way interrupted. In the night, between the 3d and 4th of November, the red vapor was so thick that the place of the moon could be distinguished only by a beautiful halo, 20° in diameter.

Scarcely twenty-two months had elapsed since the almost total destruction of Cumana by an earthquake; and as the people look on the vapors, and the failure of the breeze during the night, as prognostics of disaster, the travellers had frequent visits from persons desirous of knowing whether their instruments indicated new shocks on the morrow. On the 5th, precisely at the same hour, the same phenomena recurred, but without any agitation; and the gust, accompanied by thunder, returned periodically for five or six days.—[*Humboldt.*

AIR VOLCANO, AT TURBACO, SOUTH AMERICA.

THE persons who accompanied the travellers on their expeditions often spoke of a marshy ground situated in the midst of a thicket of palms, and which they designated by the name of Los Volcancitos. They said that, according to a tradition preserved in the village, the ground had formerly been ignited, but that a monk had extinguished it by frequent aspersions of holy water, and converted the fire-volcano into a water-volcano. Without attaching much credit to this tradition, the philosophers desired their guides to lead them to the spot. After traversing a space of about 5300 yards, covered with trunks of *Cavanillesia, Piragra superba*, and *Gyrocarpus*, and in which there appeared here and there projections of a limestone rock containing petrified corals, they reached an open place of about 908 feet square, entirely destitute of vegetation, but margined with tufts of *Bromelia karatas*. The surface was composed of layers of clay of a dark-gray color, cracked by desiccation into pentagonal and heptagonal prisms.—The volcancitos consist of fifteen or twenty small truncated cones rising in the middle of this area, and having a height of from 19 to 25 feet. The most elevated were on the southern side, and their circumference at the base was from 78 to 85 yards. On climbing to the top of these mud-volcanoes, they found them to be terminated by an aperture, from 16 to 39 inches in diameter, filled with water, through which air-bubbles obtained a passage; about five explosions usually taking place in two minutes. The force with which the air rises would lead to the supposition of its being subjected to a considerable pressure, and a rather loud noise was heard at intervals, preceding the disengagement of it fifteen or eighteen seconds. Each of the bubbles contained from 12 to 14 1-2 cubic inches of elastic fluid, and their power of expansion was often so great that the water was projected beyond the crater, or flowed over its brim. Some of the openings by which air escaped were situated in the plain without being surrounded by any prominence of the ground. It was observed that when the apertures, which are not placed at the summit of the cones, and are enclosed by a little mud wall from 10 to 15 inches high, are nearly contiguous, the explosions did not take place at the same time. It would appear that each crater receives the gas by distinct canals, or that these, terminating in the same reservoir of compressed air, oppose greater or less impediments to the passage of the aeriform fluids. The cones have no doubt been raised by these fluids, and the dull sound that precedes the disengagement of them indicates that the ground is hollow. The natives asserted that there had been no observable change in the form and number of the cones for twenty years, and that the little cavities are filled with water even in the driest seasons. The temperature of this liquid was not higher than that of the atmosphere; the latter having been 81.5°, and the former 80.6° or 81°, at the time of Humboldt's visit. A stick could easily be pushed into the apertures to the depth of six or seven feet, and the dark-colored clay or mud was exceedingly soft. An ignited body was immediately extinguished on being immersed in the gas collected from the bubbles, which was found to be pure azote.—[*Humboldt.*

SEPULCHRAL CAVE IN SOUTH AMERICA.

IN a shady and solitary place, on the declivity of a steep mountain, opens the cave of Ataruipe. It is less a cave than a projecting rock, in which the waters have scooped a great hollow, when, in the ancient revolutions of our planet, they had reached to that height. In this tomb of a whole extinct tribe we soon counted nearly 600 skeletons in good preservation, and arranged so regularly that it would have been difficult to make an error in numbering them. Each skeleton rests upon a kind of basket formed of the petioles of palms. These baskets, which the natives call *mapires*, have the form of a square bag. Their size is proportional to the age of the dead; and there are even some for infants which had died at the moment of birth. We saw them from ten inches and a half to three feet six inches and a half in length. All the skeletons are bent, and so entire that not a rib or a bone of the fingers or toes is wanting. The bones have been prepared in three different ways,—whitened in the air and sun, dried red with onoto, a coloring matter obtained from the *Bixa orellana*; or, like mummies, covered with odorous resins, and enveloped in leaves of heliconia and banana. The Indians related to us that the corpse is first placed in the humid earth, that the flesh may be consumed by degrees. Some months after, it is taken out, and the flesh that remains on the bones is scraped off with sharp stones. Several tribes of Guiana still follow this practice. Near the mapires or baskets there were vases of half-burnt clay, which appeared to contain the bones of the same family. The largest of these vases or funeral urns are three feet two inches high, and four feet six inches long. They are of a greenish-gray color, and have an oval form. The handles are made in the form of crocodiles or serpents, and the edge is encircled by meanders, labyrinths, and grecques, with narrow lines variously combined.—[*Humboldt.*

BOTANY.

INTRODUCTION.

Those who with a philosophical eye have contemplated the productions of Nature, have all by common consent divided them into three great classes, called the animal, the vegetable, and the mineral kingdoms. These terms are still in general use, and the most superficial observer must be struck with their propriety.

Vegetables are organized, supported by air and food, endowed with life, and subject to death, as well as animals. They have in some instances spontaneous, though we know not that they have voluntary, motion. They are sensible to the action of nourishment, air, and light, and either thrive or languish according to the wholesome or hurtful application of these stimulants.—Plants alone have the power of deriving nourishment, though not indeed exclusively, from inorganic matter, mere earths, salts, or airs, substances incapable of serving as food for any animals, the latter feeding only on what is, or has been, organized matter, either of vegetable or animal nature.

The food of vegetables are the mineral and animal substances, airs, and water; but in what manner this food is assimilated, is unknown. The wonderful principle of life is possessed by plants in common with animals, and the various organs of secretion, and the principles of application, are analogous in each. The use of the vegetable kingdom is not confined to the mere affording of food to animals, although, according to our present construction, without this service, all others would be useless. The air at all times is loaded with vapors which are injurious to animal life. This arises from exhalations from putrid and poisonous substances, from the breath of animals, &c. After air is received into the lungs, a part of the vivifying principle (the oxigen) is retained to purify the blood, and aid the system in its various functions, and the residue is expired, loaded with impure gas from the blood. Thus in the course of the day, from the breath of innumerable animals, and from other causes, the air becomes injurious to breathe. At this point the vegetable kingdom exerts its power, and restores the air to its former purity. In the day-time vegetables absorb the impure gasses floating in the atmosphere, and give out from their leaves the pure gas which is so essential to life.—But what is more wonderful with regard to assistance thus afforded, in the night-time they absorb the oxigen, and give out the nitrogen of the atmosphere. This is of importance to restore the equilibrium of the constituents of the atmosphere, which from various causes is disturbed during the day.

The beauty and variety the vegetable kingdom confers upon our scenery, the comfort it affords us by providing shade, contributing to the pleasures of sense, protection from the reflection of heat, and in other, almost innumerable ways, in which it contributes to our happiness, without absolutely giving us support, are of themselves of sufficient importance to render the study of the intimate nature of the individuals of this kingdom, of deep interest to every one—but when it is considered that all our comforts depend upon this kingdom, the study of Botany is of surpassing interest and consequence.

It is necessary that our knowledge of any science should be reduced to a system, in order that the mind may be able to take in the various parts at one view. 'A botanical system is a list of all the plants hitherto discovered, arranged according to certain characters, and their deviations from them.' This system is divided into classes, orders, genera, and species. There are natural, artificial, and sexual systems, each supported by different authors. From the very nature of the case, we cannot be expected to enter very minutely into this subject, but we shall endeavor to awaken an interest, and lead our readers to investigate for themselves.—Our system must necessarily be very general; we shall, therefore, lay out for ourselves the following heads, which make a system combining a great variety of divisions, but which we must consider under one, viz.: nutricious plants, medicinal plants, vegetable poisons, timber and ornamental plants, rare and curious plants.

NUTRITIOUS PLANTS.

Under this head we shall give specimens of such only as are most rare, curious, and useful; this being the chief object of our attempts. There is, we are aware, a great difficulty in drawing the line, since 'such is the peculiar construction of different classes of animals, that a plant, or part of a plant, which is harmless and inactive to one description, proves strongly medicinal to a second, a useful food to a third, and a rank poison to a fourth,' we shall take examples, therefore, from such plants as are used for food, cordials, or aromatics, by different nations, and varieties of mankind. We commence with the following selection.

BREAD-FRUIT TREE.

The systematic name Artocarpus is merely the English name of the plant translated into Greek. Of this plant there are several species; particularly A. incisa, or bread-fruit tree, with cut or indented leaves; and A. integrifolia, or bread-fruit tree, with whole leaves. The latter is called in India joccahee; it has many varieties, and bears fruit like the preceding, but of an inferior kind.

The genuine bread-fruit tree is the artocarpus incisa. Though this tree has been mentioned by many voyagers, particularly by Dampier, by Rumphius, and by Lord Anson, yet very little notice seems to have been taken of it, till the return of Captain Wallis from the South Seas.

Captain Cook, in his Voyage, observes, that this fruit not only serves as a substitute for bread among the inhabitants of Otaheite and the neighboring islands, but also, variously dressed, composes the principal part of their food. It grows on a tree that is about the size of a middling oak; its leaves are frequently a foot and a half long, of an oblong shape, deeply situated like those of the fig-tree, which they resemble in color and consistence, and in the exuding of a milky juice, upon being broken. The fruit is about the size and shape of a new-born child's head, and the surface is reticulated, not much unlike a truffle; it is covered with a thin skin, and has a core about as large as the handle of a small knife. The eatable part lies between the skin and the core; it is as white as snow, and somewhat of the consistence of new bread; it must be roasted before it is eaten, being first divided into three or four parts; its taste is insipid, with a slight sweetness, somewhat resembling that of wheaten bread mixed with a Jerusalem artichoke. This fruit is also cooked in a kind of oven, which renders it soft, and something like a boiled potatoe; not quite so farinaceous as a good one, but more so than those of the middling sort. Of the bread-fruit they also make three dishes, by putting either water or the milk of the cocoa-nut to it, then beating it to a paste with a stone pestle, and afterwards mixing it with ripe plaintains, bananas, or the sour paste which they call mahie.

The unripe artocarpus mahie, is likewise made to serve as a succedaneum for ripe bread-fruit before the season is come on. The fruit of the bread-tree is gathered just before it is perfectly ripe; and being laid in heaps, is closely covered with leaves: in this state it undergoes a fermentation, and becomes disagreeably sweet; the core is then taken out entire, which is done by gently pulling out the stalk, and the rest of the fruit is thrown into a hole which is dug for that purpose generally in the houses, and neatly lined on the bottom and sides with grass: the whole is then covered with leaves, and heavy stones laid upon them: in this state it undergoes a second fermentation, and becomes sour, after which it will suffer no change for many months. It is taken out of the hole as it is wanted for use; and being made into balls, it is wrapped up in leaves, and baked; after it is dressed, it will keep for five or six weeks. It is eaten both cold and hot; and the natives seldom make a meal without it, though to Europeans the taste is as disagreeable as that of a pickled olive generally is the first time it is eaten.

To procure this principal article of their food, costs these happy people no trouble or labor, except climbing up a tree; the tree which produces it does not indeed grow spontaneously; but if a man plants ten of them in his life-time, which he may do in an hour, he will as completely fulfil his duty to his own and future generations, as the native of our less temperate climate can do, by ploughing in the cold of winter, and reaping in the summer's heat, as often as these seasons return; even if, after he has procured bread for present household, he should convert a surplus into money, and lay it up for his children.

SIMPLE INCOMBUSTIBLES.

The only substance under this head with which we are at present acquainted is *azote*, which is also called *nitrogen*. This gas is invisible; possesses the mechanical properties of air; it neither supports flame nor animal life; and although incombustible, it is capable of being combined with oxigen gas. It enters into combination with but few substances.

ZOOPHYTES.

Zoophytes, or plant animals, are so denominated from their existing in the shape of plants. They form the connecting link between the animal and vegetable world, some of them being so nearly allied to each, that different authors have classed them under both heads. The number of zoophytes is extremely great, and the major part so nearly resemble vegetables, that they have been generally considered as such.—Some, again, have been imagined to belong to the mineral kingdom, and others are said as decidedly to belong to the animal; they are now classed under this general head, and are considered to unite the grand divisions of nature into a harmonious whole. We give the following from the Gallery of Nature and Art.

CORAL.

About the beginning of the eighteenth century, some observations were made on the common red coral, and some other species, by Count Marsigli, which seemed to prove them of a vegetable nature; for on gathering them perfectly fresh, and placing them in sea water, they appeared to put forth small flowers from all the minute cavities, or hollow points on the surface.—These, therefore, were considered as a convincing proof that coral was a plant. The arguments against this theory were, the animal odour which they diffused in burning, and a greater degree of sensibility in the supposed flowers than seemed quite consistent with the generality of plants.

A very few years after Count Marsigli's discovery and description of the supposed flowers of coral, Dr. Peysonel, a French physician, from observations made on some parts of the European coasts, as well as on those of the West Indies, ventured to propose to the French Academy, a new theory relative to the nature of corals; in which he maintained, that the supposed flowers were real animals, allied to actiniæ; and that, in consequence, the corals should be considered as aggregates of animals, either forming, or at least inhabiting the calcareous substance of the coral in which they appeared.

To this theory no great attention was paid; and several years elapsed before a farther advance was made in the knowledge of these bodies: but at length, about the year 1730, a Mr. Trembly, of Geneva, in searching after some small aquatic plants, happened to discover the animals now called polypes; these had indeed been discovered long before by Leewenhoeck, in Holland; but he only gave a general description of the animal, and observed that it multiplied by an apparent vegetation, but was ignorant of its power of reproduction after cutting: but Mr. Trembly, surprised at the singular appearance of a creature which had at once the aspect of a plant, and the motions of an animal, determined to try the experiment of cutting it, in order to ascertain its doubtful nature; and was beyond measure astonished to find that instead of destroying it, both parts seemed uninjured by the wound, and that in a very few days each had reproduced every limb that had been lost, and eat, and moved as before. This discovery being announced, was at first considered by many as a fable; and it was even contended, that this division of animal life was in itself absolutely impossible, upon the principles of common sense, as well as of sound philosophy: but at length, the attention of all Europe being excited by the singularity of the circumstance, the animals were everywhere sought after, and experiments made by cutting them in every possible direction, and their real nature thus completely ascertained; and from subsequent observations it was found that the animals of most of the coral tribes, both hard and soft, were strongly allied to polypes, and were endowed with the same reproductive properties; while others were possessed of the same power, but seemed more allied to the actiniæ, or sea-anemonies, and to the medusæ, or sea-blubbers. Afterwards the celebrated Mr. Ellis, by repeated observations made about the British coasts, proved beyond all doubt, that the smaller corals, commonly known by the name of coralines, or sea-mosses, were actually so many ramified sea-polypes, covered with a kind of strong horny case, to defend them from the injuries to which they would otherwise be liable, in the boisterous element in which they are destined to reside.

Mr. Ellis's observations on the harder, or stony corals, as well as the observations of many other philosophers, have at length proved also that these stony corals are equally of an animal nature; the whole coral continuing to grow as an animal, and to form by secretion the strong or bony part of the coral, which at once may be considered as its bone and its habitation, which it has no power of leaving, and a coral of this kind is therefore a large compound zoophyte.

SPONGE.

Sponges afford us another curious proof of zoophytic life; each of which is characterised in the Linnæan system as a fixed animal, flexile, torpid, of various forms, composed either of reticulate fibres, or masses of small spines interwoven together, and clothed with a gelatinous flesh, full of small mouths on its surface, by which it absorbs and rejects water.

After having been regarded at different periods as an organized living substance, of a doubtful kind; then as an inorganized substance; then as a vegetable; sponge is now advanced to the animal kingdom, and usually classed as we have arranged it above. So early as the days of Aristotle, it was noticed by the persons employed in collecting it, to shrink back when torn from the rocks, and was hence supposed to be in some way or other possessed of animal sensation: and this opinion, prevalent in the time of Aristotle, was still prevalent in that of Pliny. For many ages afterwards, however, these naturalists appear to have been regarded as mistaken upon this subject, and sponges were again held to be altogether insentient substances. Marsigli first in modern times, declared them to be entitled to the rank of vegetables; and Dr. Peysonel, towards the middle of the last century, sent two papers upon this subject to the Royal Society, both which are printed in its Transactions, in which he maintained that they were not vegetables, but animals; and pointed out what he conceived to be the mode of their growth and propagation. The idea had, indeed, been occasionally indulged for nearly half a century antecedently; but it was conceived too romantic and visionary for general adoption—and hence all the natural histories published at this period concur in the theory of Marsigli; and Bauhine, Lobel, Tournefort, Hill, and all the celebrated botanists of the day, give them free admission into the vegetable kingdom, and describe them as submarine plants. Ellis, however, seems to have settled the point in 1762: his observations and experiments were chiefly made upon the spongia tomentosa; he satisfactorily ascertained the existence of the animal inhabitant; remarked its contraction within its cells when exposed to pain or injury; the expiration and inspiration of water through its tubes; and established the position that sponge is an animal; and that the ends or openings of the branched tubes are the mouths by which it receives its nourishment and discharges its excrement: a position which chemistry has since abundantly supported by proving the ammoniacal property of the cellular matter of sponge.

There are forty-nine species of this zoophyte, of which the chief, denominated from their shape or places of residence, are common sponge, downy sponge, grape sponge, lake and river sponge, coxcomb sponge.

SINGULAR TRANSFORMATION.

A cannon ball was found in a bank of earth at New Haven, Ct. in 1821, which was *left* by the British in the revolutionary war. As there are some very singular circumstances connected with this ball, we extract the following account of it from Silliman's Journal.

The outside of the ball is changed into a substance, so resembling plumbago, or what is commonly called black lead, that it cannot be readily distinguished from that substance. The diameter of the ball is 3.87 in. By means of a common saw, a section was easily made through the plumbaginous coat, which at the place of the incision was half an inch deep, and supposing the coating to be equally thick, one inch of the whole diameter would be occupied by it.—This is however not exactly the fact. The change is less complete in some parts than in others. In one place the surface differs little from the common condition of cast iron, but is sensibly softer, being easily cut by a file; and it is impressible, even by a knife, and there is gradation in the softness, till it becomes so soft, that it is cut with the same ease as common black lead crayons. It has then the same lustre, the same crystaline grain, and the same semi unctuosity when rubbed between the fingers. By lying three days in a dry room, where there is a fire, the cannon ball has grown less soft, but retains all the other properties. Where it has been cut or powdered, it rusts, superficially, in the course of a day or two.

ANATOMY.

INTRODUCTION.

The science of anatomy investigates whatever enters into the composition of animated beings; and the dissection of their dead bodies is the chief means of prosecuting the study. The anatomist isolates portions, to display them more distinctly; he injects vessels, to exhibit their course; macerates some parts, to unravel their intimate conformation; dries other parts, to preserve them for future reference; and uses various other processes to facilitate his inquiries into the intricate and complicated machinery of the animal frame.—Anatomy, therefore, may be said to be the science of animal organization; and it requires such an examination of the instruments of life, as shall disclose their number, size, situation, form, color, connection, texture, and functions.

Human anatomy is a part only of a more general science, which embraces the knowledge of the structure of all classes of animals, from the most simple to the highest; but it is by far the most important part. It should be kept before the anatomist and naturalist, as a subject of suitable dignity and usefulness, not only to animate their endeavors, but to point them, to give them a direction, and to prove a criterion of their success in the pursuit of useful knowledge. On the other hand, human anatomy cannot be highly cultivated without the assistance of what is called comparative anatomy. It cannot be considered a liberal study, nor properly preserved in relation to general science, without a continual reference to natural history, and the chain of animal existence.

In respect to animals, there are principles in operation, and a structure or organization, which extend, with a certain resemblance, through the whole. There is a system of parts to give form; there is a substance the seat of irritability; there are parts the seat of sensibility and enjoyment; and the powers or endowments of those parts, however different, are supplied through the same means. They have a circulation of fluids more or less perfect (as we use the expression); they receive new matter under the influence of the same appetites; and they perfect or animalize it, and appropriate it, by similar organs. We shall hereafter confine ourselves principally to the consideration of *human* anatomy, although we may occasionally take a *comparative* view, the better to explain certain principles, and to give our readers a more distinct idea of the subject. The anatomy of the human body is considered under two different conditions: the first is a healthy state of the organs, and is termed *special anatomy;* the second is a diseased state, producing alterations of structure, and is termed *morbid* or *pathological anatomy.* Our observations will be principally confined to the former of these states, although we shall occasionally diverge, according as the interest or usefulness of subjects at any time under consideration may require.

The human body is composed of solids and fluids, united in different proportions. The solids give the form and consistence to the different parts of our bodies. They consist of bones, ligaments, muscles, tendons, vessels, nerves, &c. The fluids form the greatest part of the body, and are the blood, chyle, and all the secreted liquids, as sweat, saliva, tears, &c. These are all contained either in vessels, cells, or reservoirs. We see in the solids all that is necessary to the mechanism of the frame, and in the fluids and their vessels all that is required for its preservation. If animals required no support, and if they held an independent existence, the faculties of sensation and motion would suffice, and the nerves and muscles, which are called the animal functions, would constitute the whole active frame. But as this is not the case, and the body is in continual want of renovation, there are arranged in opposition to these, the vital functions, or such as serve for the preservation and renovation of the machine.

A double movement is in operation in organic life; one of which incessantly composes, and the other decomposes the animal. Hence the elements, or the particles which compose the animal, are continually changing, though the organization remains the same. The nutritive molecules are successively absorbed, rejected, pass from the animal to the plant, then to dead matter, again return to the animal, and are again absorbed. To this constant circulation of matter, organic life is adapted by two orders of functions: 1st, the *assimilative*, consisting of digestion, circulation, respiration, and nutrition; 2d, the *dis-assimilative*, absorption, circulation, exhalation, and secretion.

Bichat divides *life* into organic and animal, and these he subdivides. The above is the division and subdivision of the former. The latter he divides as follows. The first order of *animal* life is established from the exterior of the body to the brain. The second from this organ towards those of locomotion and voice. The impression of objects successively affects the senses, nerves, and brain; the senses receive, the nerves transmit, and the brain perceives the impression, which being thus received, transmitted, and perceived, constitutes our sensations.

The marks which essentially distinguish the organs of animal from those of organic life, are 1st, the regularity of the organs of animal life; 2d, the irregularity of the viscera of organic life.

The sense of sight is derived from two globes corresponding precisely in character; the sense of hearing, from two organs in all respects correspondent; and that of smell, from an organ, of which one portion is throughout a copy of the other. The organ of taste is symmetrical, being separated by a median line, although covered by an undivided membrane; and the skin, although extended universally over the surface, is not deficient in traces of separation, which shews the organ of touch is formed in an analogous manner. The nerves of the organs of sense, excepting that of touch, are evidently arranged in symmetrical pairs.—The brain, the organ which receives impressions, is remarkable for the regularity of its forms.

The viscera of organic life are of an entirely opposite character. Of the digestive system, the stomach, intestines, spleen, liver, &c. are all irregularly disposed. In the circulating system, the heart, great vessels, &c. there is no trace of symmetry.—Continual varieties present themselves in the vessels of the extremities, and what is remarkable, the irregularities of arrangement on one side, are not necessarily accompanied by irregularity on the other.

The principal character of the principle of life, is to withdraw the bodies which it animates, from the influence of those mere chemical affinities to which, from the multiplicity of their component parts, their mixture, moisture, and temperature, they would have a strong tendency, and to which they are immediately exposed, after death, and whereby they are reduced to their original elements.

We shall hereafter treat upon the anatomy of the solids under the following heads, viz. bones, ligaments, muscles, viscera, glands, structure and distribution of vessels, nerves, and skin. We shall treat of the fluids, their nature, formation, &c. under the head of Physiology.

LIGHT.

This substance seems to have considerable influence upon many chemical processes. The effect of light upon vegetation is well known. Many flowers follow the course of the sun; and plants that grow in houses, seem solicitous to turn to the light. Plants that grow in the shade, or in darkness, are pale, and without color: and when this is the case, they are said to be etiolated or blanched. Gardeners avail themselves of this fact to render vegetables white and tender. The more plants are exposed to the light, the more color they acquire. Yet the dead vegetable is deprived of color by exposure to it.

Vegetables are not only indebted to light for their color, but their taste and odor are derived from the same source. From this cause it happens that hot climates are the native countries of perfumes, odoriferous fruits, and aromatic resins. The action of light on the organs of vegetables causes them to pour out streams of pure air from the surfaces of their leaves, while exposed to the sun: whereas, on the contrary, when in the shade, they emit air of a noxious quality. Even animals, in general, droop when deprived of light; and it appears to be of great importance to the health and happiness of human beings.

LAC.

Lac is known under three different appellations, stick, shell and seed lac. It is the product of the *coccus lacca*, which deposits its eggs on the branches of a tree called Bihar, in Assam, a country bordering on Thibet, and elsewhere in India. It is designed for the protection of the eggs, and to afford food for the maggots in a more advanced state. It is formed into cells, furnished with as much art and regularity as a honeycomb, but differently arranged. In India, it is made into ornaments for ladies; and by us it is used for sealing-wax, varnish, &c. &c.

ANIMAL ELECTRICITY.

TORPEDO OR RAY.

There are various fishes that have the power of collecting and discharging greater or less portions of electric fluid; one of the most celebrated of which is the Electrical Torpedo, which is capable of giving a shock equal to that of a large Leyden phial.

'The body of the Torpedo is of a somewhat circular form, perfectly smooth, slightly convex above, and marked along each side of the spine by several small pores or foramina: the color of the upper surface is usually a pale reddish-brown, sometimes marked by five large, equidistant, circular, dusky spots, with paler centres: the under surface is whitish or flesh-colored. The Torpedo, however, is observed to vary considerably in the cast and intensity of its colors. The general length of the Torpedo seems to be about eighteen inches, or two feet, but it is occasionally found of far larger dimensions, specimens having been taken on the English coasts of the weight of fifty, sixty, and even eighty pounds. A specimen weighing fifty-three pounds was found, according to Mr. Pennant, to measure four feet in length, and two and a half in breadth; the head and body, which were indistinct, were nearly round; about two inches thick in the middle, attenuating to extreme thinness on the edges: below the body the ventral fins formed on each side a quarter of a circle: the two dorsal fins were placed on the trunk of the tail: the eyes were small, placed near each other: behind each was a round spiracle, with six small cutaneous rays on their inner circumference: the mouth was small; the teeth minute and spicular; the color of the animal was cinereous brown above, and white beneath.—The Torpedo is an inhabitant of most seas, but seems to arrive at a larger size in the Mediterranean than elsewhere. It is generally taken with the trawl, but has been sometimes known to take a bait, thus justifying the description of Oppian.'

The Torpedo has been celebrated both by ancients and moderns, for its wonderful faculty of causing a sudden numbness, or painful sensation in the limbs of those who touch it. Oppian says that 'the Torpedo, when caught by a hook, exerts its latent faculty in such a manner, that passing along the line and rod, it benumbs the astonished fisherman, and suddenly reduces him to a state of helpless stupefaction.' Others of the ancients have equally exaggerated the powers of this singular fish. It is evident, however, from the experiments of Mr. Walsh and others, that the Torpedo does exert a decidedly electrical force, and that of considerable power. 'The effect of the Torpedo,' says Mr. Walsh, 'appears to arise from a compressed elastic fluid, restoring itself to its equilibrium in the same way, and by the same mediums, as the elastic fluid compressed in charged glass. The skin of the animal, bad conductor as it is, seems to be a better conductor of his electricity than the thinnest plate of elastic air.' The Torpedinal Electricity was conveyed by Mr. W. through a circuit of eight persons;—the several persons were made to communicate with each other, and the two outermost with the wires, by means of water, contained in basins, properly disposed between them for that purpose. It is a singularity that the Torpedo, when insulated, should be able to give us, insulated likewise, forty or fifty successive shocks from nearly the same part; and these, with little, if any diminution of their force.—Each effort of the animal to give the shock, is conveniently accompanied by a depression of the eyes, by which even his attempts to give it even to non-conductors can be observed; in respect to the rest of his body, he is in a great degree motionless, though not entirely so. No less than fifty of the above-mentioned successive shocks, have been given by an insulated Torpedo, in the space of a minute and a half. The shock is three fourths more intense out of the water than in. The Torpedo at times induces a kind of torpor or numbness, from which he takes his name. This appears to be effected by the successive discharge of his numerous cylinders, in the nature of a running fire of musketry; the strong single shock, which is oftenest given, may be his general volley.

HAY CONVERTED INTO GLASS.

In 1827, a rick of hay was struck by lightning, and after the fire was extinguished, a quantity of vitrified matter was found at the bottom. There was every reason to believe this to be the product of the silex contained in the hay, and the lightning.—A specimen of this glass is now preserved in London.

TO OUR READERS.

We have commenced, in this number, our series of articles upon Botany and Anatomy. The present articles are composed of extracts, condensations and alterations of different authors, together with our own observations. We would observe, that at any time when we consider it for the benefit of our articles, we shall extract liberally, and, unless some one extract is long and connected, we shall not consider ourselves bound to give credit. We have had, and shall continue to have, recourse to Bell, Paxton, Parr, Spurzheim, and to the Edinburgh and other Encyclopedias, and we should be pleased to have our readers recur to those authors, that by seeking to know how near we approach our directors, they shall find themselves both interested and enlightened. Our articles on Botany, will, hereafter, consist principally of extracts.

No subject is calculated to excite a greater interest than the history of our own formation; and in this age of refinement, when it is almost a disgrace not to have general ideas upon almost every subject, to be wholly ignorant of our own construction, is to be ignorant beyond degree. The idea that it is indelicate for a lady to attend to this subject is exploded; and the most refined ladies have received a fund of amusement and instruction from the study of Anatomy. At the present time there seems to be a decided taste for the study of this science, and lectures and essays properly got up, are now in universal request. This being the case, it seems wonderful that *editors* who professionally cater for the public taste, and who wish to blend the useful with the pleasing, have never taken up the subject—but we hope the thirst after useful information, almost every where exhibited, will induce them hereafter to pay it more particular attention.

In future numbers of the Lyceum, we intend to treat particularly upon Opticks, Political Economy, and Metaphysics; our extracts will be made with great care, and where not so originally, will be fitted for the Lyceum. By the advantages we possess, we shall be enabled to present to our readers a great variety of *condensed* biographical notices, and we shall endeavor to make every sketch, however slight, both interesting and useful.

ELOCUTION.

This is a subject that has heretofore been very much neglected, but we are pleased to observe that an interest is beginning to be felt in it, and that this interest has even spread into our common schools. The advantages of a good *manner* are next to those of good matter. In many instances the defects of a faulty discourse have been entirely hid, and an interest imparted by a fine style of delivery, which have rendered it more acceptable than a perfect discourse delivered without this assistance. The study of this art will be of great utility in our schools; it will improve the general manner of the scholars; give them a relish for committing to memory; and improve their memory, and their taste. Classes have been formed in a great number of Lyceums for the purpose of improving in this art, and in many instances they have met with good success. We see no bar to success, if these classes are properly conducted, and we hope that the interest beginning to be felt upon this subject, will increase, until not only every Lyceum, but every school in the country shall devote a portion of time to the acquisition of a correct and easy manner.

PLEASANT AND USEFUL.

Some people are in the habit of thinking that nothing can be pleasant, that is of use. This is a very mistaken idea, for to a rightly cultivated mind, the pleasure arising from any object, would bear some proportion to the usefulness of that object. In fine, we should strive to make every thing we engage in, however trivial, whether for relaxation, or for the diversion of disagreeable feeling, as beneficial to ourselves as possible. This principle should be acted upon in all our arrangements. If, for instance, trees are to be planted by the road-side, to give beauty to the prospect, and shade to the traveller, those trees might be of great use if they were properly chosen. In some places in Europe, thousands of poor people are supported by the culture of silk, the worms being fed from public trees. Now if our roads were shaded by mulberry trees, the traveller would receive all the benefits that could be derived from trees of any sort, and the condition of hundreds of poor people would be rendered comfortable. By a little attention to this principle, of rendering every thing as useful as possible, our happiness here would be greatly increased. A gentleman who died at Amsterdam some years since, struck with the correctness of this principle, bequeathed two thousand florins to a benevolent society, *on condition*, that two fruit trees of full growth, should be planted over his grave, the fruit to be publicly sold by auction every year, in order to prove, that even the receptacles of the dead may be rendered beneficial to the living.

BOOK OF NATURE.

NATURAL APPEARANCES

IN FEBRUARY.

Now shifting gales with milder influence blow,
Cloud o'er the skies, and melt the falling snow;
The soften'd soil with fertile moisture teems,
And, freed from icy bonds, down rush the swelling streams.'

The earlier part of this month may still be reckoned winter; though the cold generally begins to abate. The days are sensibly lengthened; and the sun has power enough gradually to melt away the snow and ice. Sometimes a sudden thaw comes on, with a south wind, and rain, which at once dissolves the snow. Torrents of water then descend from the hills; every little brook and rill is swelled to a large stream, and the ice is swept away with great violence from the rivers. The frost, however, returns for a time; fresh snow falls, often in great quantities: and thus the weather alternately changes during most part of this month.

Various signs of returning spring occur at different times in February. The woodlark, one of the earliest and sweetest of our songsters, often begins his note at the very entrance of the month. Not long after rooks begin to pair, and geese to lay.—The thrush and chaffinch then add to the early music of the groves. Moles go to work in throwing up their hillocks as soon as the earth is softened. Under some of the largest, a little below the surface of the earth, they make their nests of moss, in which four or five young are found at a time. These animals live on worms, insects, and the roots of plants. They do much mischief in gardens, by loosening and devouring flower-roots; but in the fields they do no more damage than rendering the surface of the ground unequal by their hillocks, which obstruct the scythe in mowing. They are said also to pierce the sides of dams and canals, and let out the water: but this can only be an accidental occurrence, attended with their own destruction.

Many plants emerge from under ground in February, but few flowers yet adorn the fields or gardens. Snow-drops in general are fully opened from the beginning of the month, often peeping from the midst of the snow!

'Already now the snow-drop dares appear,
The first pale blossom of the unripen'd year;
As Flora's breath by some transforming power,
Had changed an icicle into a flower;
Its name and hue the scentless plant retains,
And winter lingers in its icy veins.'

The alder-tree discloses its flower-buds; the catkins of the hazel become very conspicuous in the hedges, and young leaves appear on the gooseberry and currant bushes. The farmer, as soon as the ground is sufficiently thawed, ploughs his fallows: sows beans and pease, and rye spring wheat.

'Joyous th' impatient husbandman perceives
Relenting nature, and his lusty steers
Drives from their stalls, to where the well-us'd plough
Lies in the furrow, loosen'd from the frost;
There, unrefusing, to the harness'd yoke
They lend their shoulder, and begin their toil,
Cheer'd by the simple song and soaring lark.
Meanwhile, incumbent o'er the shining share,
The master leans, removes the obstructing clay,
Winds the whole work, and sidelong lays the glebe.
While through the neighboring field the sower stalks,
With measur'd step, and lib'ral throws the grain
Into the fruitful bosom of the ground.'

The husbandman also, at this season, sets his early potatoes; drains his wet land; dresses and repairs his hedges; lops his trees, and plants those kinds which love a wet soil, as poplars and willows; and, with

——'Fancy fir'd, anticipates their growth.'

WINTER IN THE POLAR REGIONS.

Nor are the symptoms of returning spring confined to the inhabitants of our temperate climate; they also begin, towards the middle of this month, to be sensibly felt by those of the icy regions of the north.

Their winter, however, is very different from ours. The single night of the country about Spitzbergen begins about the 30th of October. The sun then sets, and never appears till about the 10th of February. A glimmering, indeed, continues some weeks after the setting of the sun: then succeed clouds and thick darkness, broken by the light of the moon, which is as luminous as in England, and during this long night shines with unfailing lustre. The cold strengthens with the new year; and the sun is ushered in with an unusual severity of frost. By the middle of March, the cheerful light grows strong, the arctic foxes leave their holes: and the sea-fowl resort in great multitudes to their breeding places. The sun acts no more after the 14th of May. The distinction of day and night is then lost.

But to make up for the want of sunshine in such a long and tedious winter, the wisdom and goodness of God has amply provided, by furnishing, in addition to the light of the moon, the northern inhabitants of our globe with such a copious display of the *aurora borealis*, or what the common people here call *streamers*.

In Shetland, these northern lights, which the natives call *merry dancers*, are the constant attendants of the clear evenings, and prove great reliefs amid the gloom of the long winter nights. They commonly appear at twilight near the horizon, of a dun color, approaching to yellow; sometimes continuing in that state for several hours without any apparent motion; after which they break out into streams of stronger light, spreading into columns, and altering slowly into ten thousand different shapes, varying their colors from all the tints of yellow to the most obscure russet. They often cover the whole hemisphere, and then make the most brilliant appearance. Their motions at these times are most amazingly quick; and they astonish the spectator with the rapid changes of their form. They break out in places where none were seen before, skimming briskly along the heavens. On a sudden they are extinguished, and leave behind a uniformly dusky tract.

This again is illuminated in the same manner, and as suddenly left a dull black. In certain nights they assume the appearance of vast columns, on one side of the deepest yellow, on the other declining away till it becomes undistinguished from the sky. They have generally a strong tremulous motion from end to end, which continues till the whole vanishes. In a word, we, who only see the extremities of these northern phenomena, have but a faint idea of their splendor and their motions.

In Siberia there is one species of the aurora borealis, which regularly appears between the north-east and east, like a luminous rainbow, with numbers of columns of light radiating from it. Beneath the arch is a darkness, through which the stars appear with some brilliancy. There is another kind, which begins with certain insulated rays, from the north, and others from the north-east. They augment little by little till they fill the whole sky, and form a splendor of colors rich as gold, rubies, and emeralds; but the attendant phenomena strike the beholders with horror; for they crackle, sparkle, hiss, make a whistling sound, and a noise even equal to artificial fireworks.

In Hudson's bay, moreover, the firmament in winter, is not without its beauties. The night is enlivened by the aurora borealis, which spreads a thousand different lights and colors over the whole concave of the sky, not to be defaced even by the splendor of the full moon; and the stars are of a fiery redness.

WONDERS OF THE NORTH.

As we advance into these dreary regions, we meet with those picturesque objects which attract and captivate the most incurious eye. In the icy seas, and particularly at Spitzbergen (which is the largest of that group of frozen islands, which go under that name, or that of New Greenland,) the forms assumed by the ice are extremely pleasing. The surface of that which is congealed from the sea water is flat, even, and hard, resembling white sugar, and is capable of being slid upon. The greater pieces, or fields, are many leagues in length: the smaller are the meadows of the seals, on which those animals, at times, frolic by hundreds. The motion of the smaller pieces is as rapid as the currents: the greater, which are sometimes 200 leagues long, and sixty or eighty broad, move slowly and majestically. They often fix for a time, immoveable by the power of the ocean, and then produce near the horizon that bright white, called by mariners the *blink of the ice*. These float in the sea like so many rugged mountains, and are sometimes five or six hundred yards thick: but the far greater part is concealed beneath the water. These are continually increased in height by the freezing of the spray of the sea, or of the melted snow which falls on them. Those which remain in this frozen climate receive continual growth; others are gradually wafted by the northern winds into southern latitudes, and melt by degrees, by the heat of the sun, till they waste away, and disappear in the boundless element.

The collision of the great fields of ice in high latitudes is often attended with a noise, that for the time takes away the power of hearing any thing else; and the meeting of the lesser fields is attended with a grinding of unspeakable horror. The water which dashes against the mountainous ice freezes into an infinite variety of forms, and gives the voyager ideal towns, streets, churches, steeples, and every shape which imagination can frame.

The icebergs or glaciers of the north-west of Spitzbergen are among the capital wonders of the country.

Frost sports with these icebergs, and gives them majestic as well as other most singular forms.—Masses have been seen assuming the shape of a gothic church, with arched windows and all the rich tracery of that style, composed of what an Arabian tale would scarcely dare to relate, of crystal of the richest sapphirine blue. Tables with one or more feet, and often immense flat-roofed temples, supported by round transparent columns of cerulean hue, float by the astonished spectator. The icebergs are the creation of ages, and receive annually additional heights, by the falling of snow and rain, which often instantly freezes, and more than repairs the loss by the influence of the melting sun.

Such are part of the wonderful phenomena of the polar regions, and the best improvement we can make of such awful and terrific scenes, is to compare them with what we daily behold at home, and learn contentment with that spot, where Providence, all-wise, has fixed our residence.

'One of the great arts to escape superfluous uneasiness, (says a celebrated writer,) is to free our minds from the habit of comparing our condition with that of others on whom the blessings of life are more bountifully bestowed, or with imaginary states of delight and security, perhaps unattainable by mortals. Few are placed in a situation so gloomy and distressful as not to see, every day, beings more forlorn and miserable, from whom they may learn to rejoice at their own lot.

'A native of England, pinched with the frosts of December, may lessen his affection for his own country by suffering his imagination to wander in the vales of Asia, and sport among woods that are always green, and streams that murmur; but if he turns his thoughts toward the polar regions, and considers the nations to whom a great portion of the year is darkness, and who are condemned to pass weeks and months amid mountains of snow, he will soon recover his tranquility; and, while he stirs his fire, or throws his cloak about him, reflect how much he owes to Providence, that he is not placed in Greenland or Siberia.'

METEOROLOGY.

RED SNOW.

THE extraordinary phenomenon of *red snow* observed by Capt. Ross and other Arctic voyagers, naturally excited the greatest interest both at home and abroad. This singular aspect of a substance, with which we never fail to associate an idea of the purest and most radiant whiteness, has been ascertained to result from an assemblage of very minute vegetable bodies, belonging to the class of cryptogramic plants and the natural order called *algæ*. They form the species named *protococcus nivalis* by Agardh, which is synonymous with the *uredo nivalis* of Mr. Bauer. This plant seems by no means peculiar to the Arctic snows, but occurs on limestone rocks in the island of Lismore in Scotland, as well as among the Alpine and other countries of Europe. Saussure observed it so long ago as in the year 1760 on Mount Breven in Switzerland, and so frequently after that period, that he expresses his surprise at its having escaped the notice of Scheuchzer and other learned travellers. Raimond, whose observations so beautifully combine the precision of science with the perception of the picturesque, found red snow on the mountains of the Pyrenees, as did Sommerfeldt, the botanist, on those of Norway.—In the year 1818, vast masses of the same substance overspread both the Apennines and the Italian Alps; and it is recorded, that ten years prior to that period, the vicinity of Belluno and Feltri were covered to the depth of twenty centimetres with rose-colored snow.

According to Captain Ross, the Arctic mountains on which he observed the red snow are about 600 feet high, and extend 8 miles in length. The depth to which the color penetrated has been variously stated by different observers. Some found that it descended many feet beneath the surface, while others never ascertained that it spread beyond one or two inches. There is no reason to suppose that the coloring matter itself, as well as the snow, is a meteorological product, although Humboldt certainly mentions a shower of red hail which fell at Paramo de Guanacos, in South America.—Moisture is no doubt essential to the production of this plant, as it is to that of all the other algæ; but when once formed, it seems to possess the power of continued and increasing vegetation, even over rocks and stones, with only an occasional supply of fluid. The propagation of minute vegetable forms, like the increase of animalcules, is effected, under favorable circumstances, with a rapidity of developement truly astonishing; and the most probable conjecture seems to be, that snow is not the natural situation of the *protococcus nivalis*, but that, from its great tenacity of life, it not only preserves its vitality on that chilly and ungenial surface, but, during the partial thawing of the snow, continues to increase and multiply. If such be the case, it is easy to suppose how a wide expanse may be covered with this red suffusion, during the dissolving and occasional flowing of the snowy waters. When once established among the eternal snows of the north, it becomes more numerous than the sands of the ocean; and, increasing in density from year to year, at last presents to the astonished and admiring navigator a sight more surprising in its reality than any of the fabled wonders of an Arabian tale.—[*Ex'd.*

[The above extract exemplifies the dependence of one branch of science upon another. The extraordinary appearance of *red snow*, would have excited unlimited wonder in the mind of a mere Meteorologist, and he would have either been silent from astonishment, or have attributed the red appearance of the snow to one of the numberless freaks of Nature. But the Botanist steps in to his assistance, examines the substance, and not only assigns the cause for this seeming departure from general rules, but classifies and arranges the coloring matter. The Knowledge of the science of Botany is more complete after such investigations, for either an idea of an unknown genus or species is acquired, or additional light is thrown upon the habits or variations of known species—and the Meteorologist or observer of Nature is no longer at a loss in what manner to account for unnatural appearances.]—ED.

HUMAN COMBUSTION.

A most curious, and, if not well authenticated, a scarcely credible species of spontaneous inflammation, has been, in a few rare instances, known to occur in the human body. It is not quite certain indeed, whether the first inflammation has been quite spontaneous, or caused by the approach of a lighted substance; but in these melancholy accidents, the body of the unfortunate sufferers has been brought to a state of such high combustibility, that the flame once kindled, has gone on without other fuel, to the entire destruction of every part, (the bones and extremities excepted) and, as it appears, has been attended with actual flame, of a lambent faint light. This change is the more remarkable, as the human body, in all its usual states, both of health and disease, is scarcely at all of itself combustible, and cannot be reduced to ashes without the assistance of a very large pile of faggots, or other fuel; as universal experience, in the very ancient mode of sepulture, and the history of martyrdoms, abundantly shews. Cases of this human combustion on record, have occurred in different countries. Two of them, well authenticated, are recorded in the Philosophical Transactions, and occurred in England; and a few others in Italy, France, and elsewhere. In all but one, the subjects of them have been females, rather advanced in life, of indolent habits, and apparently much addicted to spirituous liquors.

QUAGGA.

THIS is a beautiful animal, and has been till lately confounded with the Zebra. It is now, however, acknowledged to be a distinct species, though closely allied to it, but marked with fewer and larger bands, which are of a browner color than the zebra, and are chiefly disposed on the fore parts of the animal; while the hind parts are rather spotted than striped. The ground color, also, of the quagga is of a ferruginous tinge, especially on the thighs and back. It is of a milder or more docile nature than the zebra, and is said to have been successfully used by some of the Dutch colonists at the Cape, in the manner of a horse, for draught, &c. It inhabits the same parts of Africa as the Zebra, but is found in separate herds, never associating with that species.

QUESTIONS

ON THE LAST NUMBER OF THE LYCEUM.

WHAT is the configuration of the crater of Mount Etna?

What is the size of the crater?

Will you give some account of the appearance of the crater as seen from its edge?

Is there more than one crater to Etna? and will you describe the other?

Will you give an account of the observations made by the traveller as related in the extract?

What are the exercises of the school lyceum lately formed in the town of F.?

What was the manner of the boys on its first formation?

What, after it had been a short time in operation?

What is the popular feeling with regard to attending the meetings of this lyceum?

Give some account of its formation and progress?

What two principles are illustrated by the success of this Lyceum?

To what is it necessary to subject all sheaves?

What does President Beecher think the fate of all republics depends upon?

What should be the great aim in efforts to assist the west?

What are the first, the second, the third, the fourth, and fifth propositions of Mr. Sturtevant?

In what are fishes inferior to other animals?

Will you give the distinctive traits of fishes?

What is the new invention of Mr. Perry that is thought to be of value?

Will you describe his map? and in what is it superior to common maps?

Will you give some of the leading objects of the School Agent Society?

What distinguishes civilized from uncivilized nations?

Will you give some traits in the character of the uncivilized tribes mentioned in the evening entertainment.

What was the guide to ships in the early ages?

Are the fixed stars of any use at the present day in directing the traveller?

Is frost in any way beneficial to the farmer?

Describe the phenomena of snow, hail, and hoar-frost?

Give some account of the saw-fly?

Of what use is the saw? and how is it used?

What principle in political economy, meets with an apt illustration in the habits of this insect?

Describe the process of depositing its egg?

Give a synopsis of Dr. Ure's observations on indigo?